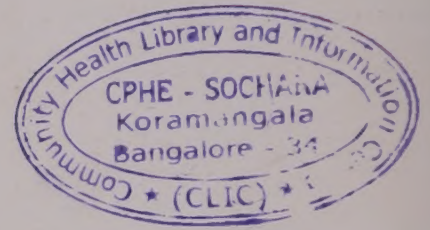




Statistics of some
of the world's food and
agricultural problems

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DIMENSIONS OF NEEDS

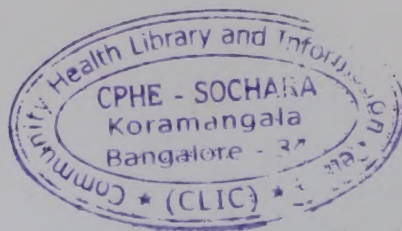
Statistics of some of the world's food and agricultural problems



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This booklet illustrates some of the principal dimensions of world food and agricultural problems as seen by FAO at the beginning of the 1980s. It draws extensively on our perspective study of *Agriculture: toward 2000*, which indicates the improvements possible if suitable strategies and policies are followed.

Most of the charts and maps in the booklet are concerned with developing countries. This is because the world's food and agricultural problems are so largely centred in these countries, with their massive poverty and rapidly growing populations. But these problems cannot be solved, in our increasingly interdependent world, by the developing countries alone. Much greater assistance is needed from the richer countries, especially in the form of more enlightened trade policies, and expanded technical and financial assistance and food aid.

Not all aspects of the world's food and agricultural problems are amenable to statistical and graphical presentation. The accompanying text, therefore, goes somewhat further than a simple commentary on the charts and maps, and attempts to bring out some of the other issues as well.

In particular, there are many broader issues of rural development, including the need for structural changes in such basic areas as land tenure, the institutions providing essential services for farmers, and those which are needed for a fuller participation of rural people, including women, in their own development. These issues were very fully discussed and agreed at FAO's World Conference on Agrarian Reform and Rural Development in 1979.

At the outset of the 1980s, the world food and agricultural

situation gives rise to serious concern. The goals of the Second United Nations Development Decade, covering the 1970s, are still a long way from realization. Global negotiations on the most pressing problems, including those of food and agriculture, are at an impasse, and little progress has been made toward a New International Economic Order.

Food and agricultural production in the developing countries has failed to increase sufficiently. Food shortages and emergencies have become even more frequent than in the past, and the number of refugees and displaced persons requiring special assistance has reached appalling proportions. The number of people in the third world suffering from severe undernourishment, and the consequent impairment of their health, activity and life expectancy, has not yet stopped increasing. Cereal stocks, an essential component of world food security, are likely to have fallen in 1981 to the lowest level in five years. Thus, the world is scarcely better prepared to cope with a major and widespread food crisis than it was in the early 1970s.

Yet, as *Agriculture: toward 2000* shows, enormous improvements could be made between now and the end of the century. What has to be done is undoubtedly complex and difficult, but the broad lines as proposed by FAO have already been agreed at many intergovernmental conferences. I hope that this booklet will contribute not only to a better understanding of the problems but also to the necessary commitment to the steps that are required to overcome them in both developing and developed countries.

Edouard Saouma
Director-General

Food production falls short in the third world

The world's food supply remains a cause for serious concern in the early 1980s. Food production declined on a per caput basis in both 1979 and 1980.

The main actions needed to alleviate hunger and malnutrition are increased food production in developing countries and more equitable distribution of food supplies among their people. The food and agricultural production of these countries as a whole actually rose by about 3 percent a year during the 1970s, but this fell a quarter short of the 4 percent target set by the United Nations International Development Strategy for that decade.

Some 20 developing countries raised their output by an average of 4 percent or more a year in the 1970s. In almost half of the 106 developing countries included in the chart, production gains lagged behind population growth, and output per caput declined.

The major danger areas were Africa (where regional food

production per caput declined by more than 1 percent a year) and the poorest countries in the other developing regions. Between 1971 and 1980 there was a fall in food production per caput in 50 developing countries, most of them in Africa. Of the countries where production declined, 24 were classified as MSA countries. These are the countries most seriously affected by the financial and balance-of-payments crisis of the early 1970s and suffering particularly from other adverse factors, and they include the poorest countries in the world.

The implications of continuing inadequate food production in so many developing countries are all the graver because of the rise in emergency situations caused by wars and natural catastrophes. The resulting number of refugees and displaced persons who had to be fed and cared for on an emergency basis soared to an estimate of seven million in Asia and about three million in Africa.

Food¹ production per head developing countries

		Annual average rate of change %						
Regional rate of change %		—2.1 and below	—2.0 to —1.1	—1.0 to —0.1	0 to 1.0	1.1 to 2.0	2.1 to 4.0	over 4.0
Africa	—1.1	Namibia, Mozambique, Ghana, Algeria, Morocco, Zimbabwe, Somalia, Gambia, Congo, Togo	Angola, Ethiopia, Mauritius, Malawi, Botswana, Mauritania, Zaire, Guinea, Uganda, Kenya	Zambia, Senegal, Sierra Leone, Tanzania, Madagascar, Nigeria, Liberia, Lesotho, Chad, Central African Republic	Benin, Burundi, Ivory Coast, Cameroon, Upper Volta, Mali, Gabon, Guinea-Bissau	Reunion, Tunisia, Rwanda, Niger, Swaziland		
Latin America	1.2	Honduras, Trinidad and Tobago, Peru	Barbados	Dominican Republic, Jamaica, Haiti, Chile	Guyana, Uruguay, Venezuela, Ecuador, Mexico, Bolivia, Panama, Costa Rica	Nicaragua, Guatemala, Paraguay, Brazil	Cuba, Colombia, El Salvador, Suriname, Argentina	Bahamas
Near East	0.5	Lebanon, Jordan	Iraq, Yemen Arab Republic	Afghanistan, Egypt, Cyprus, People's Democratic Republic of Yemen	Sudan, Iran	Turkey, Saudi Arabia	Libya	Syria
Far East	0.7			Nepal, Burma, Bhutan	Lao, India, Indonesia, Pakistan, Bangladesh	Malaysia, Philippines, Brunei	Sri Lanka, Thailand	Republic of Korea
Other developing market economies	0.8			Samoa	Papua New Guinea	Fiji		Vanuatu
Asian centrally planned economies	1.8	Democratic Kampuchea	Mongolia		Viet Nam	China	Democratic People's Republic of Korea	

Note: Countries in each group are listed in ascending order of the annual rate of change in their per caput food production. ¹ Excluding fish.

Distribution of food supplies is highly uneven

If world food supplies were distributed equitably, there would be enough to feed all the world's people at nutritionally adequate levels. But they are shared very unevenly between the relatively wealthy developed and the largely poor developing countries, among the developing countries themselves, and among the different population and income groups within them.

FAO monitors developments in food supplies per caput by compiling national food balance sheets. These show the average supply available from all sources for a country or region but do not necessarily indicate what individuals actually consume.

Developed countries as a group have for many years enjoyed dietary energy supplies much greater than their nutritional requirements — about one third larger, in fact, in recent years.

Developing countries, taken together, just met their dietary energy requirements in 1978, but because of maldistribution this statistical achievement means little and conceals widely varying national and regional situations. The Near East, for example, reached an average of 100 percent of its requirements in 1969-71 and subsequently gradually exceeded them — by 16 percent in 1978. Latin America, already 8 percent above requirements in 1969-71, exceeded them by 11 percent in 1978.

Africa, however, stagnated between 1969-71 and 1978, being 6 percent below requirements in both periods. Populous Asia progressed slightly, from 8 percent below requirements in 1969-71 to 5 percent below in 1978. Asian countries with centrally planned

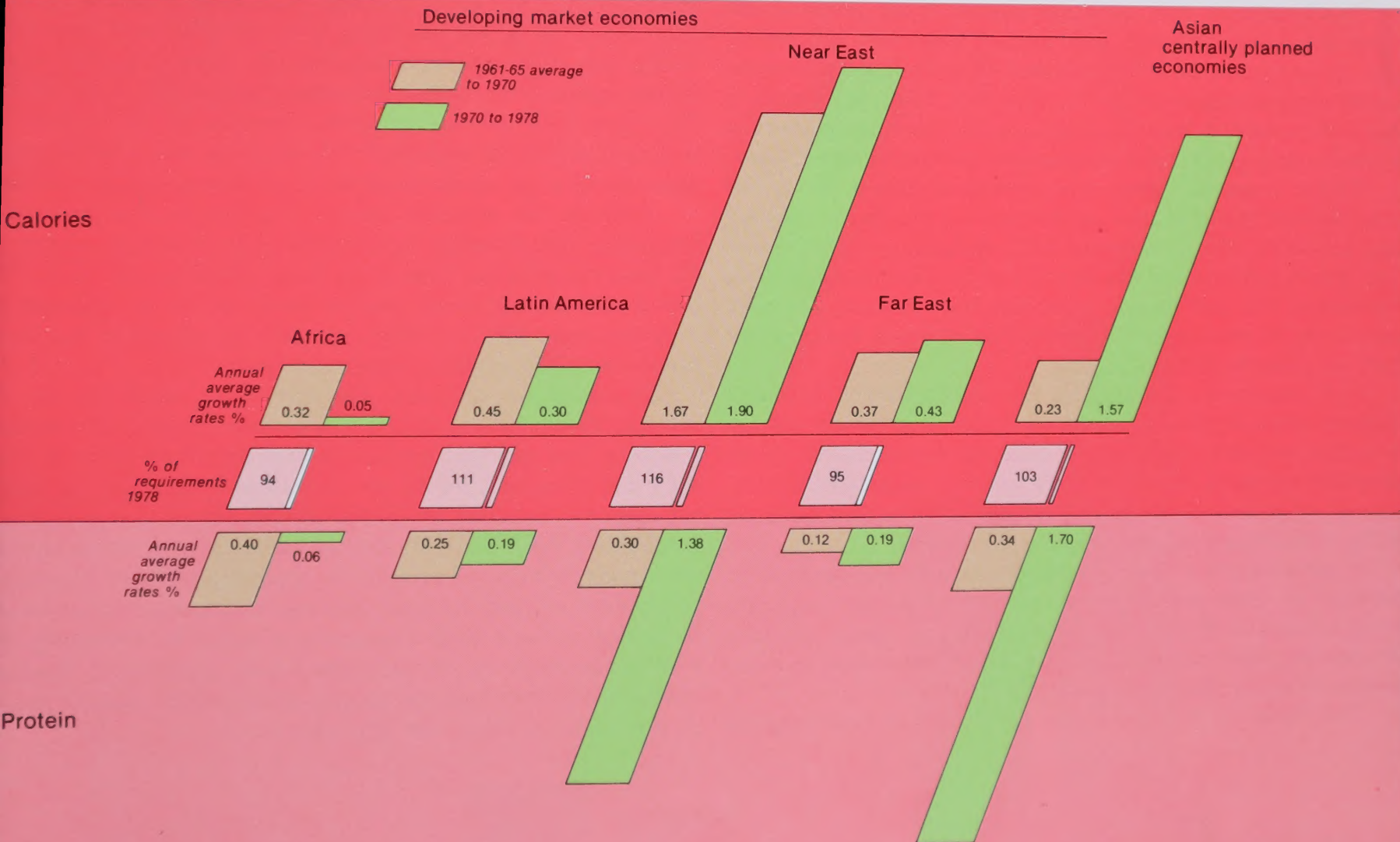
economies improved from an average 9 percent deficit in 1969-71 to a 3 percent excess in 1978.

As usual, the MSA countries were worst off. Nine percent below their dietary average energy requirements in 1969-71, they remained 8 percent in deficit in 1978 after a 15 percent gap in 1975. With such a large deficit in terms of averages, the position of poorer population groups must have been very serious.

Generally, the diets of the 3 251 million people estimated as living in developing countries in 1980 also lack the variety of those of the estimated 1 164 million inhabitants of developed countries. Cereals provide about twice as much dietary energy on average for people in the third world as for those in the industrialized countries. Meat, fish and eggs supply about three times as much on average for people in developed countries as they do for those in the developing.

As is shown in the chart, there have been small improvements in food supplies per caput in each of the developing regions. This is the case even in Africa, where rapidly rising food imports have partly made up for the fall in domestic production per caput. All in all, however, these improvements have, as indicated in the next chart, been far too small to have much impact on the incidence of hunger and malnutrition. In both Africa and Latin America, the improvement was much less between 1970 and 1978 than between 1961-65 and 1970. Almost everywhere, supplies of protein per caput rose considerably less than those of dietary energy.

Food supplies per head in developing countries ¹



¹ Data base is 43 representative countries having almost 80% of developing countries' total population.



FAO estimates that about one quarter of the people in the developing countries with market economies are undernourished. Almost three quarters are to be found among the poverty-stricken masses of the Far East, but Africa has almost as high a proportion of undernourished people. The total numbers of undernourished people have continued to increase in recent years.

Twelve countries suffer from undernourishment on a vast scale. With estimates of their undernourished rounded in millions, they are: India (201), Indonesia (33), Bangladesh (27), Nigeria (14), Brazil, Ethiopia and Pakistan (12 each), the Philippines (10), Afghanistan (6) and Burma, Colombia and Thailand (5 each). More than 40 percent of the populations of Chad, Ethiopia and Haiti are undernourished.

FAO regards its estimates of the undernourished as useful indicators of the dimensions of the world nutrition problem and not as precise statistics. Many factors must be considered to obtain acceptable estimates. A human being becomes undernourished because of an inadequate intake of food, and malnourished when the intake is inadequate in both quantity and quality.

A diet sufficient to cover energy requirements will generally be sufficient to meet protein needs, except for people (especially young children) subsisting on starchy roots and tubers, plantains and the like, which are low in protein. The criterion used to assess undernutrition is, therefore, dietary energy intake.

The choice of the critical limit to be used in identifying the

undernourished is a major problem. Nutritional requirements vary from person to person according to levels of activity, sex, body weight, etc. A precise assessment of the undernourished would require comparisons of each individual's intake and requirements. Since such data are not available, estimates of the number of undernourished have been made by comparing intake with a single minimum level of requirements for a given population.

FAO set the minimum intake at a level it believes neither exaggerates nor minimizes the problem of world hunger, namely at 1.2 times the standard value of the basal metabolic rate (BMR). The BMR is the rate at which heat is given off by an organism at complete rest. The 1.2 level includes an allowance for body maintenance and minimum physical activity.

Estimated on this basis, the total daily deficit for the 86 countries covered in the chart is 311 thousand million kilo-calories. Assuming that an equal amount of food had to be given to each individual (because it would not be feasible to estimate the different amounts required by individuals in accordance with their deficiencies), FAO estimates that 37 million tons of wheat equivalent would be required annually to raise the intake of the undernourished to at least 1.2 BMR. Although this quantity is very small in relation to total world population, it would be immensely difficult to ensure that it actually reached those in need of it. The only lasting answer is to raise the incomes of the world's poorest people so that they can afford the food they need.

Magnitude of undernutrition in developing countries ¹



¹ Data based on information for 86 developing countries for 1974-76.





Cereals are the foundation of world food security because they are the basic food of most of mankind. The slow, inadequate growth in the cereal production of the developing countries and the consequent rapid increase in their imports of cereals are cause for concern. The trends from 1970/71 to 1980/81 are strikingly reflected in the accompanying chart.

These trends cause concern for the following reasons:

— While some developing countries, such as oil exporters, can afford large cereal imports, most of the countries concerned have serious balance-of-payments problems and cannot pay for enough cereals to satisfy domestic demand.

— The low-income countries (those with incomes per caput of US\$680 or less in 1980) have had a particularly rapid increase in their imports, which already totalled 36 million tons in 1979/80.

— In 1970/71, developing countries imported 43 million tons of cereals and received 30 percent of this quantity in food aid. By 1980/81 their imports exceeded 90 million tons and food aid provided only slightly more than 10 percent.

— The developing countries' cereal import bill of US\$17 thousand million in 1979 was equal to two thirds of all official development assistance from the rich countries.

— Soaring cereal imports not only devour limited foreign exchange needed to import items that promote domestic agricultural and overall development but make most developing countries increasingly dependent on external sources for much of their food.

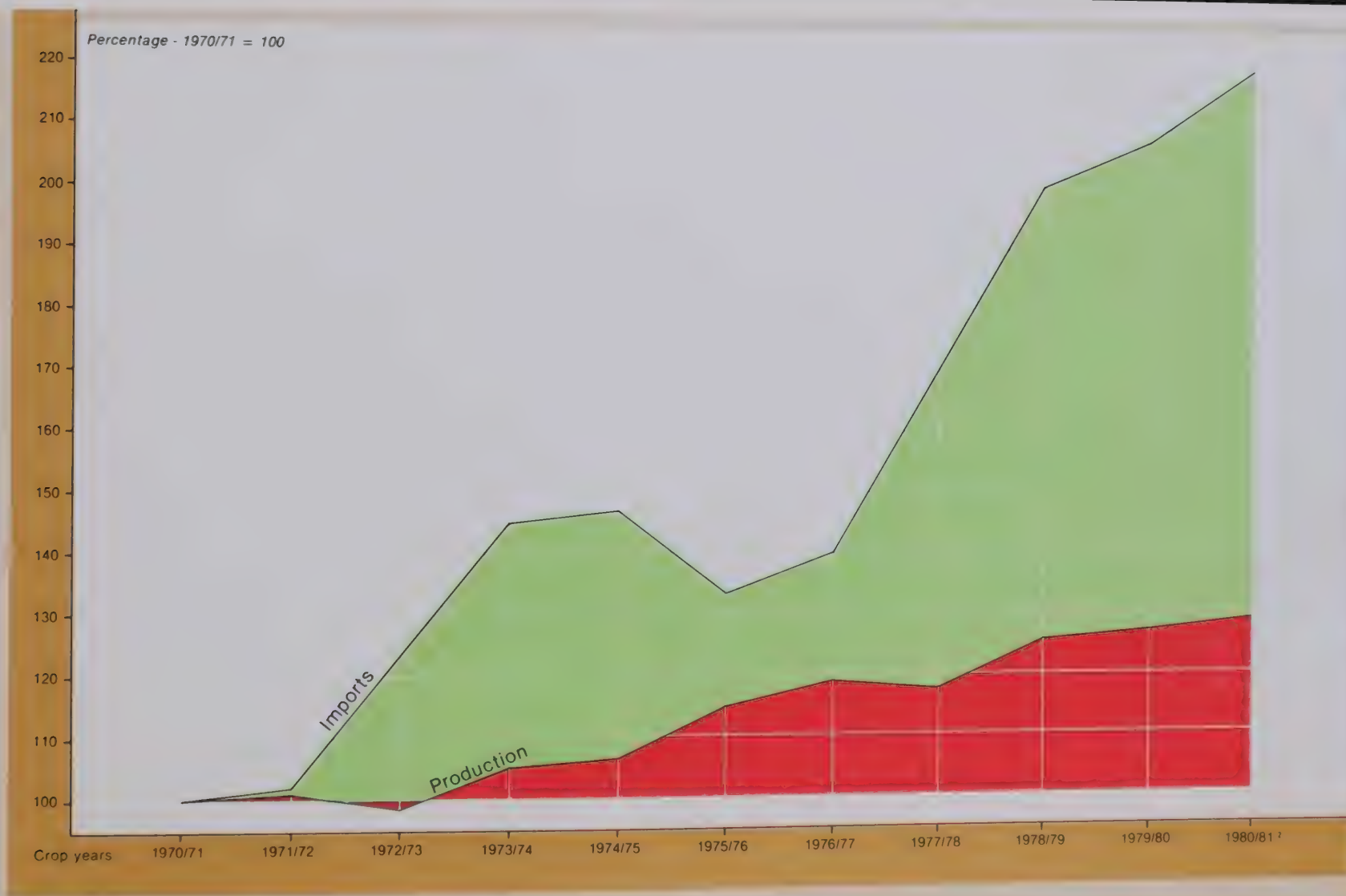
In the short term, developing countries need much more

assistance, particularly increased food aid, most of which goes to the neediest countries, to close their cereal supply gaps. The goal of at least 10 million tons a year of food aid in cereals set in 1974 by the United Nations World Food Conference was still not met by the early 1980s, while worsening food shortages, particularly in Africa, pointed to the need to raise the target. It is also essential that the goal of 500 000 tons of cereals and other foods set for the International Emergency Food Reserve be reached each year.

As FAO Director-General Edouard Saouma has noted: "The experience of the mid-seventies has shown that, when supplies get tighter and prices rise, the negative factors reinforce each other and tend to make the position of the developing countries more vulnerable. Thus, there is a serious danger that the level of food aid may fall just when it is most needed." The new 1980 Food Aid Convention provided significant, though not complete, protection against this danger by raising the minimum annual contributions to 7.6 million tons of food grains from the level of 4.2 million tons under the previous convention.

In the long term, however, the key to reducing and ultimately abolishing hunger in the developing countries is a sustained increase in their own food production, so as to raise their self-sufficiency. This will require them to undertake structural reforms and give agriculture sufficient priority. It will also help loosen the bonds of poverty that grip most of their people and prevent them from buying the minimum food they need even when sufficient supplies are available.

Cereal production and imports in developing countries ¹



¹ Cereals comprise wheat, rice in milled equivalent and coarse grains.

² Forecast

V Planned reserves for food security

Not only has food production failed to increase sufficiently in the developing countries, but it also fluctuates sharply from year to year, mainly because of the weather. Abnormal food shortages and emergencies created by nature and man have been especially frequent in the late 1970s and early 1980s. The world is now better equipped to take prompt action to meet such emergencies as a result of FAO's Global Information and Early Warning System, but the effectiveness of this action depends on the availability of adequate reserves of food.

Reserve stocks, particularly of cereals, are thus a vital element of world food security. The volume of world stocks gives an indication of their adequacy to meet acute and large-scale food shortages, although their real effectiveness obviously depends upon their availability at the right time and place to feed those in need.

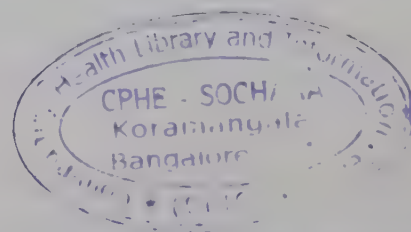
FAO considers a minimum safe level of cereal stocks to be about 17 percent of world consumption. During the world food crisis, these stocks fell from 17 percent of consumption in 1972 to 13 percent in 1973. They then hovered around 14 percent through 1976. As the chart shows, they rose to 18 percent of consumption in 1977 and to 19 percent two years later. But in the early 1980s the outlook is again unsatisfactory. A drop in food production per caput two years running and rapidly rising cereal imports caused a

sharp drawing down of stocks, probably again to a level of only about 14 percent of consumption in 1981. Thus, the world in the early 1980s is hardly better prepared than it was in 1973/74 to meet a major food crisis.

A package of actions promoted by FAO to ensure that every country has an adequate food supply at all times includes the creation, on a voluntary basis, of an internationally coordinated system of basic food stocks. Such a system is provided for in an International Undertaking on World Food Security to which more than 80 countries have subscribed by the early 1980s. Only some 45 nations, however, have explicit stock policies with food security objectives.

The existing stocks are very unevenly distributed, being heavily concentrated in North America and a number of other developed countries.

Too few developing countries have established the necessary food security policies, and essential external assistance to the poor countries to create reserves has lagged. Financial support for FAO's Food Security Assistance Scheme is inadequate, but nevertheless by the early 1980s the Scheme has completed eight projects and has almost 30 active projects in more than a dozen countries at a cost of over US\$30 million.



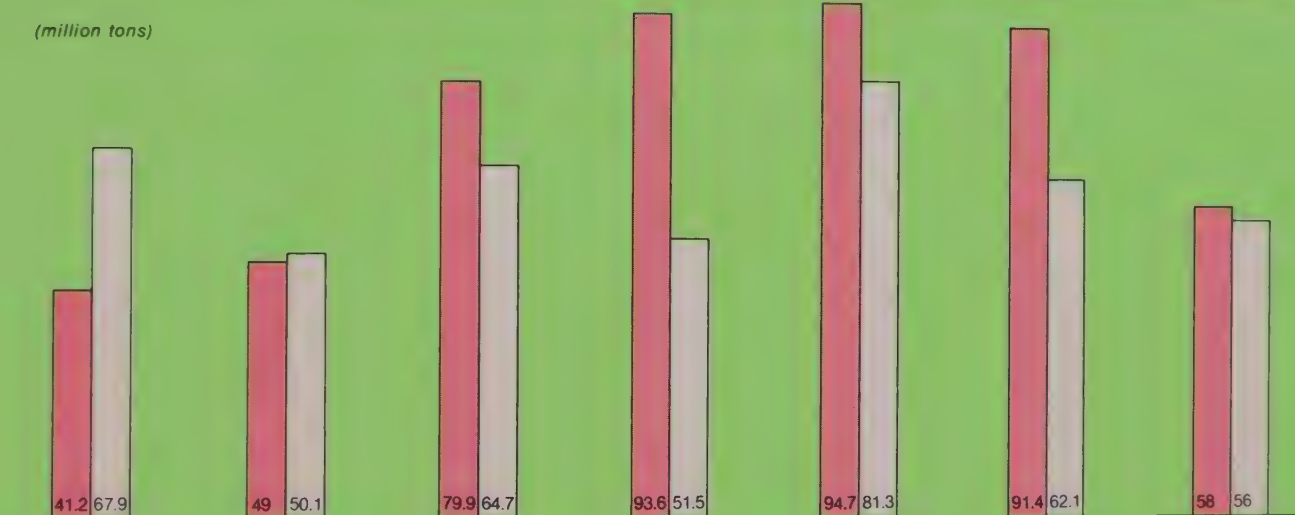
Cereal stocks¹ in developed and developing countries

Crop year ending in

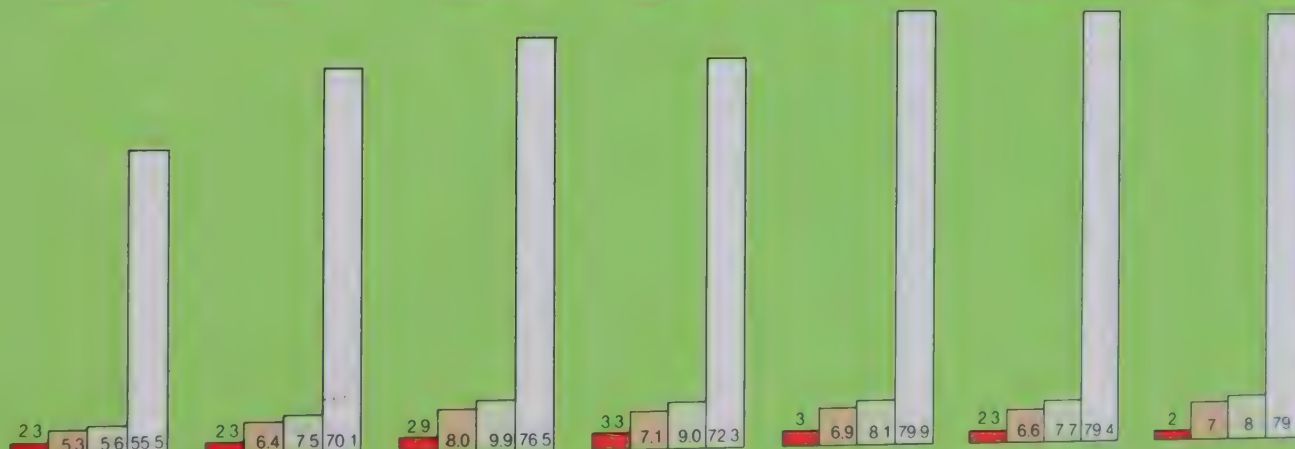
1975 1976 1977 1978 1979 1980² 1981³

(million tons)

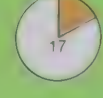
Developed countries



Developing countries



World stocks as
% of consumption



¹ Stock data are based on an aggregate of national carryover levels at the end of national crop years and should not be construed as representing world stock levels at a fixed point of time
² Estimate
³ Forecast

VI The exports of the third world

While the foremost food security challenge to developing countries in the 1980s is to reverse the fall in their self-sufficiency in basic foods, they must also increase their foreign exchange earnings from exports of agricultural, fishery and forest products if their overall development is not to continue to suffer badly.

The total value of such exports by developing countries, at current prices, was US\$62 700 million in 1977, US\$66 100 million in 1978 and an estimated US\$73 400 million in 1979. However, as the developed countries were able to raise their agricultural exports at a considerably faster rate, the share of developing countries in this trade declined from 32 percent in 1977 to 30 percent in 1978 and to an estimated 28 percent in 1979.

Although the poor countries' total agricultural exports have steadily grown, the chart shows that their food imports have exceeded their food exports since the mid-1970s. For forest products, too, they have had a small trade deficit for the same period.

A basic feature of a New International Economic Order adopted by the United Nations in 1974 is the call for major changes in world trading relationships. FAO's perspective study, *Agriculture: toward 2000* (of which details are given on subsequent

pages), concluded that the developing countries could, under certain conditions, raise their share of world agricultural exports and substantially increase their net earnings by the year 2000. Such achievement, however, requires more radical changes in agricultural trade policies than governments have been willing to negotiate up to now. The national policies of many developing countries also need to be revised so as to increase the priority and resources for food and agricultural production and agro-industrial development.

In large measure, the study found, satisfactory progress depends on a willingness by the governments of the developed countries to formulate their national policies so as to accommodate their actual and potential trading partners. This would require finding and introducing ways of protecting domestic interest groups without resorting to protectionist barriers to trade, which hamper the development efforts of developing countries. It would involve devising ways of shifting resources of developed countries more quickly out of high-cost industries and liberalizing the access to markets for low-cost suppliers. And, the study added, it would call for accelerating their technical and financial assistance to developing countries to enable them to expand their food and agricultural production.

Agricultural trade in developing countries

(in thousand million US\$)

Food ¹



¹ Excludes fish which are shown separately; includes all cereals, although a portion is fed to animals.

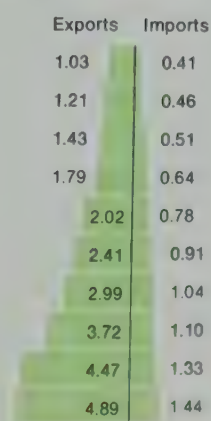
Beverages ²



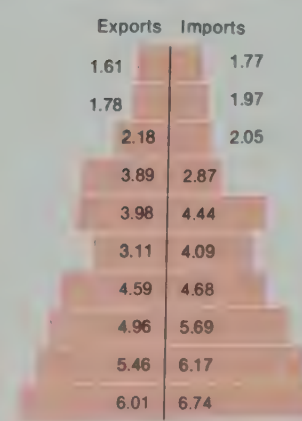
Raw materials ³



Fishery products



Forestry products



Animal feed ⁴



² Excludes cocoa which is included in food.

³ Excludes forestry products.

⁴ Excludes feed produced from fish





VII Sources of increased crop production

Each developing country needs to develop a strategy to increase its food and agricultural production best suited to its own conditions. Some generalizations at regional and world levels can be made, however, because certain factors and situations are common to many countries.

FAO's perspective study, *Agriculture: toward 2000*, points out what needs to be done to drastically reduce undernutrition and hunger in the third world by the end of the century. It analyses some of the actions that must be taken to accelerate the increase in agricultural production and raise incomes and demand. The study covers 90 developing countries with 98 percent of the third world's population, excluding China. It does not forecast or predict what will happen by 2000. Based on an analysis of the long-term perspectives of individual countries, it provides a global framework of future world demand, production and trade within which individual countries can work out their perspectives on the basis of a detailed analysis of their own agricultural possibilities, constraints and objectives.

A basic question for raising crop output is whether more land can be brought under cultivation or the extent to which existing land can be made to produce more. FAO's study concludes that increased yields per unit of harvested land would have to provide

almost two thirds of the goal of an average annual growth of 3.5 percent in crop production between 1975 and 2000 assessed as feasible for the 90 developing countries it covers. The balance would come from greater cropping intensity (more harvests each year) and from the expansion of the arable area.

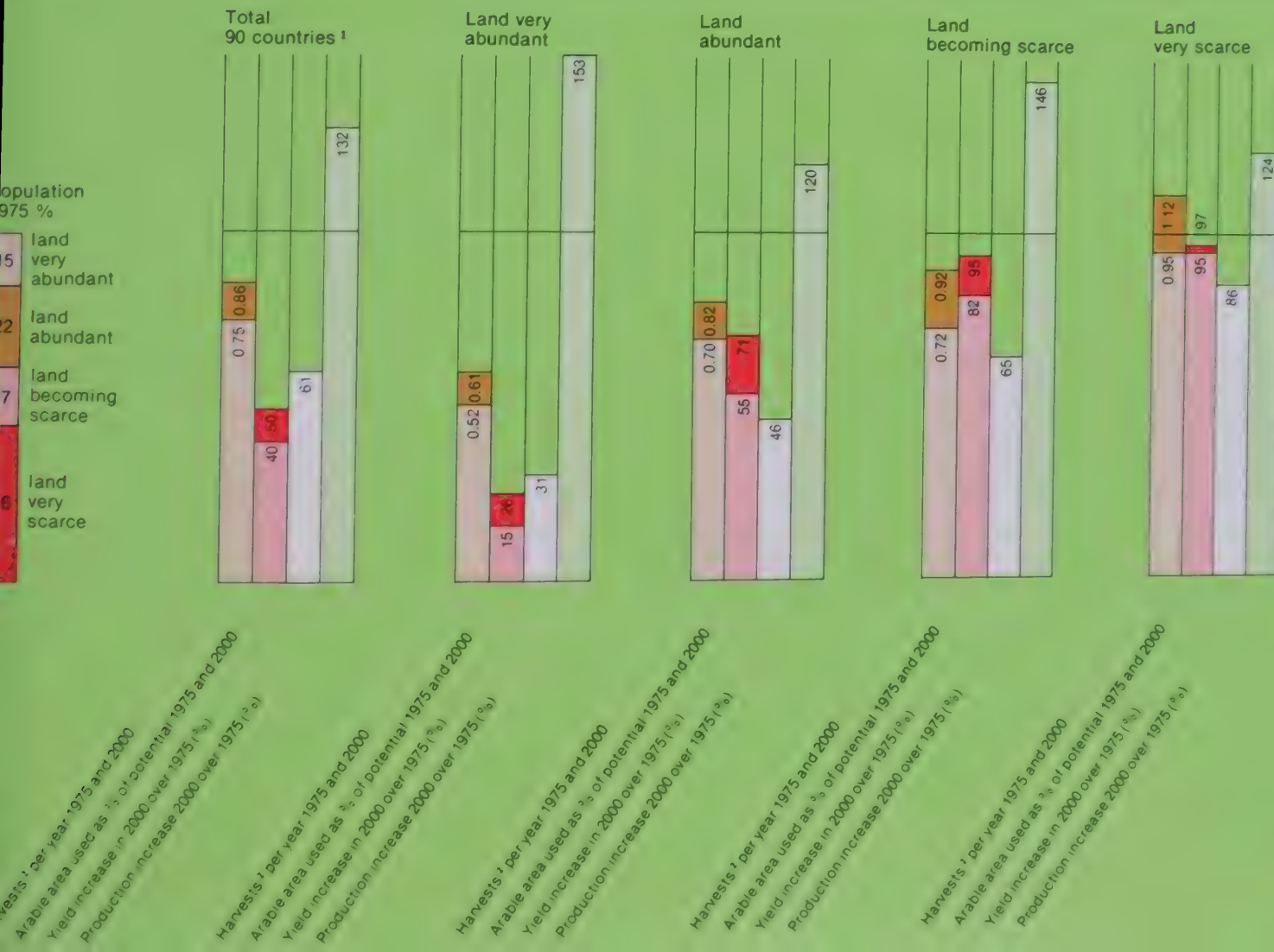
However, the production patterns would vary greatly from region to region. The Far East and the Near East, with tight land-man ratios, could bring little more land under cultivation and would have to rely heavily on more intensive use of already cultivated land. In these two regions, the combined effect of higher yields and cropping intensity would lead to a more than doubling of output per hectare of arable land.

In the other two regions, opportunities exist for significant expansion of arable land — by some 55 percent in Latin America and 30 percent in Africa. Therefore, the need for intensification is somewhat less pronounced than in the other two regions: output per hectare of arable land would need to increase by some 50 percent and 85 percent, respectively.

In practice, the FAO study emphasized, the proportion of the different sources of increased crop production will be highly specific to individual countries.

Food availability and sources of crop production increase in developing countries

By countries classified according to land availability



¹ Data cover 90 developing countries used as the basis for FAO's perspective study Agriculture: Toward 2000. Figures for 2000 are those projected in the study of what could and should be accomplished if a development goal of a growth toward 4 percent a year for agricultural production of the 90 countries is accepted.

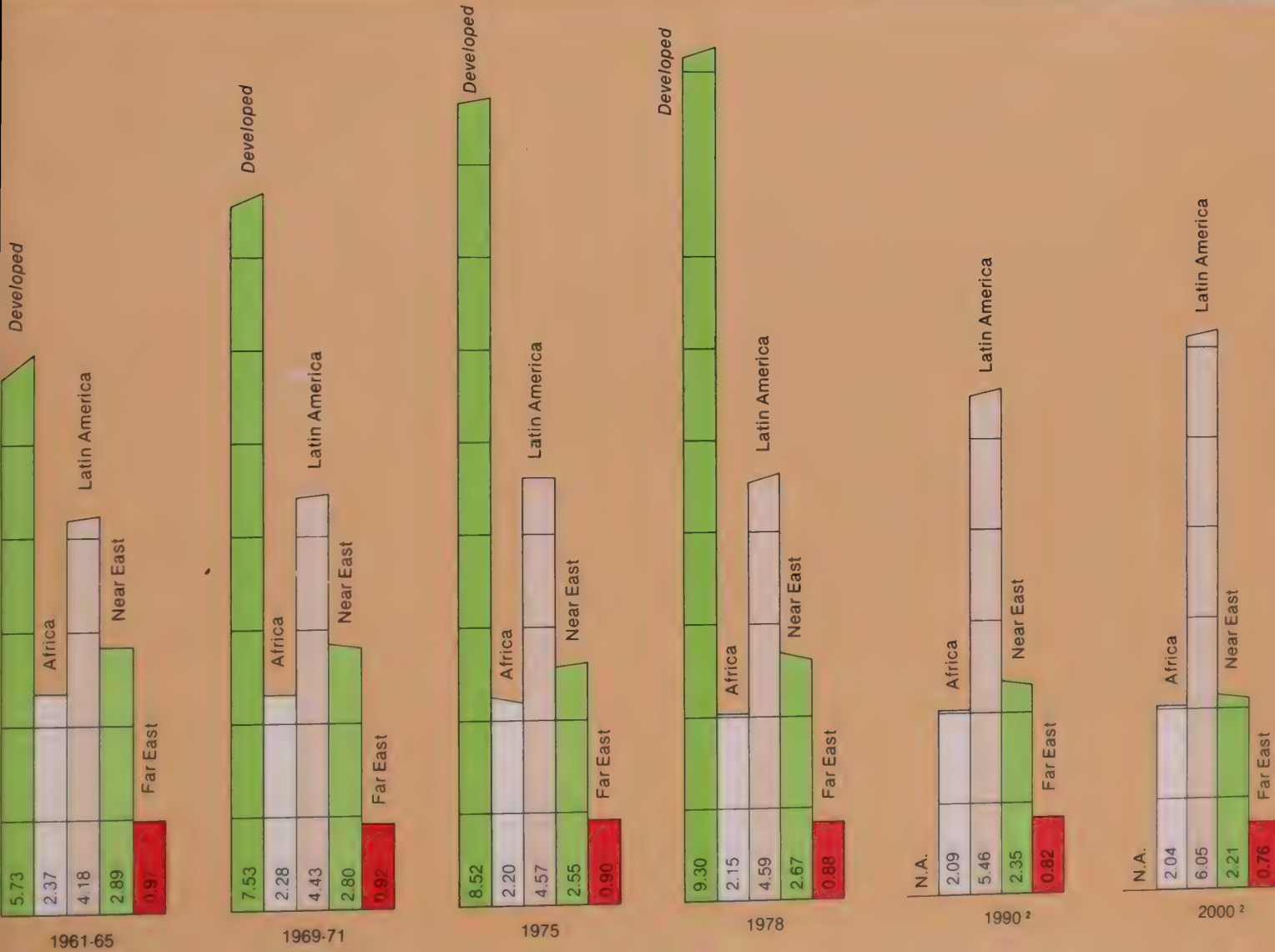
During the 1960s and 1970s, the developing countries brought a considerable amount of additional land under cultivation, although already almost two thirds of the growth in production came from higher yields. As the chart shows, the amount of arable land available per agricultural worker actually decreased in each of the developing regions except Latin America, and this trend is expected to continue at least until the end of the century. In the developed countries, in contrast, the land per agricultural worker has been increasing quite rapidly, as a consequence of rapid outflow of labour away from agriculture.

In both the developed and developing countries as a whole, the share of the total work force engaged in agriculture is decreasing. In the industrialized countries, the share of active agricultural workers dropped from 18.5 percent in 1970 to 13.1 percent in 1979. Their absolute numbers also decreased, from about 89 million to some 70 million in the same period. In the developing countries, the share of the economically active population working in agriculture fell from 66 percent in 1970 to 60 percent in 1979. But with populations rising rapidly in many countries, the total agricultural labour force still grew in absolute numbers from about 700 million in 1970 to almost 750 million in 1979.

The land/man ratio has important implications for food and agricultural production and for employment and incomes. The use of modern technology, including tractors and other power-operated equipment, quality seeds, fertilizers and pesticides, has greatly increased the productivity of farmworkers in the industrialized countries. As a result, an individual worker has been able to take care of a larger amount of land — an average of more than 9 ha in 1978 compared with about 6 ha in the early 1960s. His productivity and income have consequently generally risen.

The challenge to all developing countries is to help their farmers raise their productivity by using a balanced package of agricultural practices and inputs that is suited to their natural and socio-economic conditions. The individual components of such a package include irrigation and drainage, fertilizers, improved seeds, plant protection and power equipment. To put these tools in the farmers' hands will require much more investment in agriculture. It will also require major improvements in government services to farmers, particularly these concerned with input delivery, credit and extension, and their better adaptation to the needs of small producers.

Arable land in use for agricultural worker¹



¹ Data cover 90 developing countries used as the basis for FAO's perspective study Agriculture: Toward 2000. China is not included in the study. Arable land includes permanent crops.

² Figures for 1990 and 2000 are those estimated in Agriculture: Toward 2000. They describe what could and should be accomplished if a development goal of a growth of toward 4 percent a year for agricultural production of the 90 developing countries covered by the study is accepted.

After land, the availability of water is the major constraint to the expansion of agricultural production in many developing countries. Flood control, drainage, the improvement of existing irrigation systems and creation of new ones must be given high investment priority. Where water and high-yielding plant varieties are present, fertilizers are considered to be the most important component of modern farm technology. It is estimated that they were responsible for roughly half of the increases in crop yields in developing countries between 1965 and 1976. Assessments in Western European countries credited fertilizers with from 40 to 60 percent of crop production in 1979/80.

The chart indicates that the production and consumption of fertilizers in developing countries have grown faster since the late 1960s than in the developed countries. But it also shows that the poor countries started from incomparably smaller production and consumption bases, and that, except for the Asian centrally planned economies, they lag far behind the developed countries in fertilizer use per hectare. Further very rapid increases in fertilizer use in developing countries are proposed in FAO's study of *Agriculture: toward 2000*.

There are many constraints to expanding fertilizer use in the third world. For governments with limited foreign exchange, the cost of fertilizers, whether produced locally or imported, appears high. For the typical farmer who cultivates a small piece of land, traditionally has no cash and for whom credit facilities are scarce, fertilizers seem out of reach. Another common constraint is lack of fertilizer of the right type in the right place at the proper time and in sufficient quantity. Others are farmers' lack of knowledge on the efficient use of fertilizers and the uncertainty of a fair return for their produce because of a possible crop failure, fluctuating prices, or an inadequate marketing system.

Fertilizers are responsible for about one third of the commercial energy used in world agricultural production. In some developing countries, more than two thirds of the commercial energy consumed is devoted to fertilizers. Some economies could be achieved by the more efficient use of fertilizers and by the greater use of the organic materials that are at present to a great extent wasted. However, any reduction in agricultural production's small share (between 3 and 4 percent) of the total world use of commercial energy would be likely to jeopardize future progress.

Fertilizer ¹ Production and consumption

	Production <i>Million metric tons</i>			Consumption <i>Million metric tons</i>		
	1968/69	1978/79	Annual rate of change %	1968/69	1978/79	Annual rate of change %
Market economies						
Developed countries	41.79	57.46	3.2	34.66	48.17	3.3
Developing countries						
Africa	0.40	0.84	7.8	0.48	1.11	8.7
Latin America	0.99	2.89	11.3	2.46	6.22	9.7
Near East	0.41	1.79	15.9	0.95	2.68	10.9
Far East	1.46	5.54	14.2	3.27	8.58	10.1
Centrally planned economies						
Asia	2.16	8.59	14.8	3.67	10.59	11.2
Eastern Europe & USSR	16.72	35.62	7.9	14.98	29.36	7.0

¹ Content of three primary nutrients: N, P₂O₅, K₂O.

² Excludes permanent pasture.

Consumption
of fertilizers ¹
per hectare
of arable
and
permanent
crops ²
1978/79

Developed
countries

122.0
kg

Africa

7.8
kg

Latin
America

43.9
kg

Near East

33.1
kg

Far East

32.5
kg

Asia

94.6
kg

Eastern Europe
& USSR

105.6
kg





Many pests and diseases take a huge toll of food and agricultural production both before and after harvesting. Major activities in combating these include FAO's work in many countries on locust and grain-eating bird control, and its Action Programme for the Prevention of Food Losses.

A pest that has a particularly serious effect on economic and social development is the tsetse fly which infests some 40 percent of 21 million km² of the total land area of 37 African countries south of the Sahara (see map).

The tsetse transmits trypanosomes, which are parasitic protozoans causing sleeping sickness in man and trypanosomiasis in animals, diseases which deny man the full economic potential of the land in a continent that has the most serious problem feeding its 470 million people. It is difficult to estimate the potential carrying capacity of the tsetse-infested areas but a total of 120 million cattle or their equivalent in other ruminant livestock is considered as not unrealistic.

A programme for the control of African animal trypanosomiasis, where technically feasible and economically justifiable, and for the simultaneous promotion of economic and social development in these areas was initiated by FAO in 1980 after a five-year preparatory phase. The complexity and magnitude of the problem, as well as the funds required, dictate that the Programme must be long-term and that operational priorities be carefully evaluated to

ensure early action where most needed. The FAO Commission on African Animal Trypanosomiasis, created to review and advise on Programme policies and strategies, recommended that tsetse control should not be supported in the absence of appropriate land-use plans.

Although a vaccine against animal trypanosomiasis is still a research objective, there are several control strategies available. These include the use of curative and prophylactic trypanocidal drugs and the exploitation of local breeds of trypanotolerant cattle, sheep and goats. Chemotherapy is commonly used for trypanosomiasis control and more than 30 million doses are currently used each year. In situations where the technology for tsetse control is lacking at present, the rearing of trypanotolerant livestock is an important alternative land-use strategy.

A variety of methods for control of the tsetse have developed. By far the most important in use at present is insecticide application to vegetation communities/complexes which form the habitat of the fly. If applied correctly and under controlled operational conditions, insecticides are very effective in rapidly reducing tsetse numbers.

In savannah areas with low development potential and sparse human populations, the utilization of wildlife may be the best development policy.

tsetse-infested areas and cattle distribution in Africa

Countries with 90-100% of total area infested	1979 (thousand head) cattle distribution ²	Total area ¹ (km ²)
Benin	800	112 600
Central African Republic	670	623 000
Congo	71	342 000
Equatorial Guinea	4	28 000
Gabon	3	267 700
Gambia	280	11 300
Ghana	930	238 500
Guinea	1 700	246 000
Guinea-Bissau	264	36 100
Ivory Coast	650	322 500
Liberia	38	111 400
Sierra Leone	270	71 700
Togo	250	56 000
Taire	1 144	2 345 400

Countries with 30 to 89% of total area infested	1979 (thousand head) cattle distribution ²	Total area ¹ (km ²)
Angola	3,120	1 246 700
Cameroon	3 027	475 400
Mozambique	1 380	801 600
Nigeria	12 000	923 800
Senegal	2 806	196 200
Tanzania	15 300	945 100
Upper Volta	2 700	274 200
Zambia	1 800	752 600

Countries with under 30% of total area infested	1979 (thousand head) cattle distribution ²	Total area ¹ (km ²)
Botswana	3 300	600 400
Burundi	386	27 800
Chad	4 070	1 284 000
Ethiopia	25 900	1 221 900
Kenya	10 470	582 700
Malawi	790	118 500
Mali	4 459	1 240 000
Namibia	3 000	824 300
Niger	2 995	1 267 000
Rwanda	640	26 300
Somalia	3 800	637 700
Sudan	17 300	2 505 800
Uganda	5 367	236 000
Zimbabwe	5 000	390 600

 Tsetse-infested
areas

 Cattle
distribution



World fisheries entered a new era in the early 1980s, with almost all of the marine living resources currently exploited coming under the control of coastal countries. By the end of 1980, 100 coastal nations had declared exclusive economic zones (EEZs) or similar zones of extended jurisdiction, most of them stretching 200 nautical miles from their shores. An immediate effect was to bring under the control of coastal countries stocks previously exploited by non-local fishing fleets. These caught some 16 million tons of fish off the coasts of other countries in 1972, when few extended zones existed. Catches off developing countries totalled just over 5 million tons, with an annual landed value of more than US\$2 000 million.

While on a world basis 12.5 kg of fish and other marine products were available per caput in 1979, average consumption in the third world was only 8.4 kg. Many developing coastal countries should now be able to improve their fisheries and thus expand their supplies of animal protein or their exports of products such as shrimp that are valuable in international trade.

All coastal nations have the opportunity to build stable and

profitable fishing industries on the basis of the fish stocks now under their jurisdiction. How well they can manage these fisheries and how quickly they substitute systematic and rational control for unlimited, free-for-all exploitation will determine their success. Without good management, problems of overfishing and overcapacity can just as easily result within zones of national jurisdiction as outside them.

FAO has established a special programme of assistance to developing countries in the management and development of their economic zones. The overall goal is to strengthen their efforts to secure a greater share of, and higher benefit from, living marine resources as part of the initiatives to establish a New International Economic Order. Action under the programme will be carried out largely by a network of technical support units in the developing regions. By the beginning of 1981, eight units, most of them based on existing regional field projects, had been established. If the necessary political and financial support became available, some 10 such units could eventually be established around the world.

Marine fish catch main fishing areas ¹



The outlook in the early 1980s for supplies of industrial forest products and fuelwood is not encouraging. The world possesses huge forest resources but the rate of depletion of natural tropical forests and the already critically short supplies of fuelwood in many poor countries are causes for serious concern.

An FAO assessment of natural tropical forests (summarized in the chart) estimates that 142 million ha, or 12 percent, would be deforested between 1975 and 2000, largely owing to clearing for agriculture. Less than 12 million ha would be added to industrial plantations in tropical countries by 2000. The vast depletion has implications for the amounts and special types of industrial wood, such as veneer logs, that tropical forests will be able to supply for export or, increasingly, for developing countries' own use or processing. A more immediate negative effect is on the environmental protection the forests provide. Flood, drought, erosion, siltation and a serious loss of agricultural production often result. Although cautioning that such estimates were inevitably speculative because of the lack of reliable forestry data on many areas, FAO judges that world supplies would be barely sufficient to meet a demand of something over 2 500 million m³ of industrial wood by the end of the century. This is roughly the same as the amount that FAO's

perspective study, *Agriculture: toward 2000*, estimates would be needed for processing into sawnwood, panels and paper. However, there would be particular strain on supplies of tropical hardwood logs, softwood logs and pulpwood, and of all wood in Japan and Western Europe.

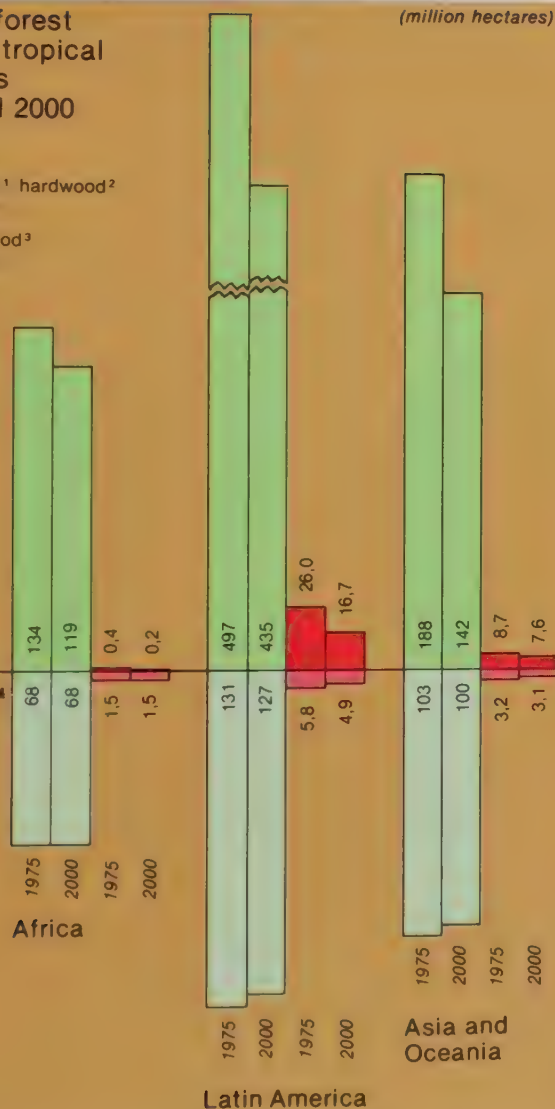
The chart also indicates that almost half of all wood consumed in 1979 was burned as fuelwood in the third world. FAO estimates that of some 2 000 million people in developing countries who depend primarily on wood for cooking and keeping warm, about 1 000 million consumed less than their fuelwood needs or were depleting wood resources to meet them. By 2000, unless trends change, more than 2 500 million people are expected to live in areas with inadequate fuelwood supplies. Measures can be taken to conserve wood fuels, such as appropriate use of charcoal, better designed but simple wood-burning stoves, and to produce more wood from existing tree resources through better management. But the only long-term solution is to create, with the active involvement of local people, new fuelwood sources especially by plantings in villages woodlots, in small groups or lines along the borders of farmlands or on roadsides and river banks.

Two major aspects of world forestry

Natural forest areas in tropical countries 1975 and 2000

■ Closed¹ hardwood² forests
■ Softwood³ forests

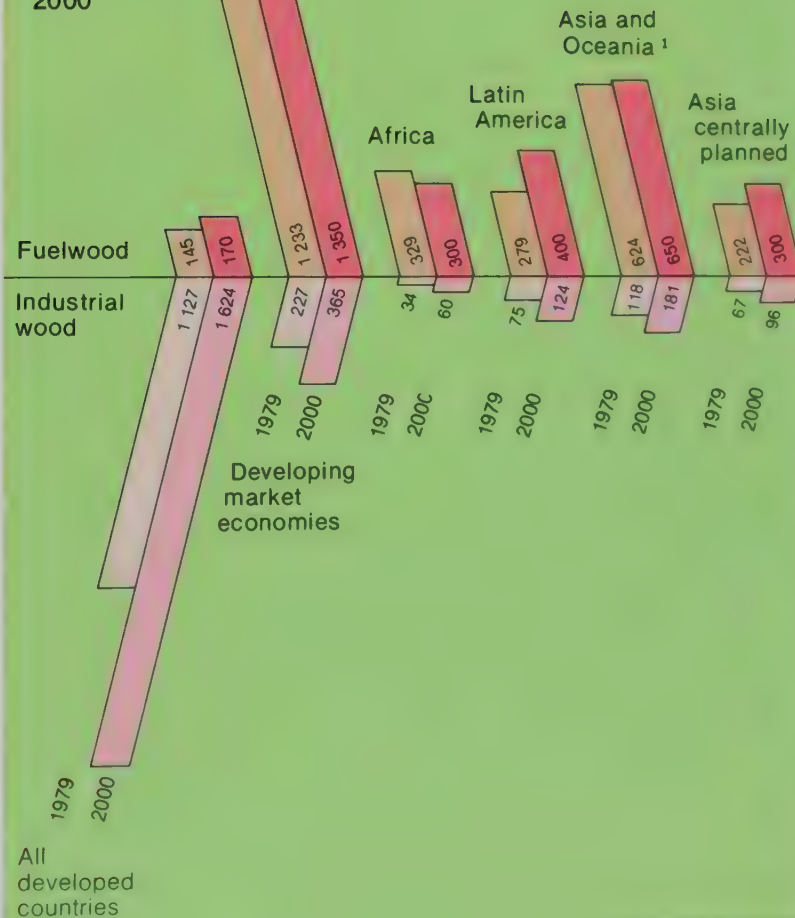
Inoperable⁴
 Inoperable⁴



¹ The distinction between closed and open is made only for vegetation types with broad-leaved species, and relates more to the types than to a fixed percentage of tree cover.
² Predominantly broad-leaved over large areas.
³ Predominantly coniferous over large areas.
⁴ Inoperable forests are those reserved for non-productive purposes, permanently unproductive (of industrial wood), or inoperable because of the terrain (e.g., steepness, swampiness); the concept is, therefore, wider than economic accessibility, since distance to consumption or export centres is not considered.

World forest use (wood removals) 1979 and 2000

(Million cubic metres)



¹ Asia includes Near East





FAO's perspective study, *Agriculture: toward 2000*, estimates the requirements of current inputs and investments needed to achieve a substantial acceleration in the agricultural growth of the developing countries. The resulting financial requirements (some of which are summarized in the chart) are very large in absolute terms, but not in relation to the potential production growth and reduction of poverty and hunger.

Gross annual investments (including large replacement costs) for crop production would have to rise very substantially to US\$69 000 million in 2000; for livestock production to US\$22 000 million; and for support (storage, marketing, transport and processing) to US\$39 000 million. Thus, the total annual gross investment should increase to US\$81 000 million in 1990 and to US\$129 000 million by 2000.

These large financial estimates are more meaningful in terms

of what the investments would achieve. One of the many cumulative investments not shown separately on the chart is US\$22 400 million for 116 million sets of hand-tools. Others include US\$4 000 million to increase the total of draught animals by 10 million pairs and US\$57 000 million for standard sets of equipment for them comprising a plough, harrow, seeding tube and two-wheel cart.

The developing countries would have to provide most of these expanded investments themselves, including part of the foreign exchange requirement. If given greater trading opportunities, they would be able to cover a larger share of this requirement. Much larger external assistance for agriculture will also be needed. FAO estimates that such assistance should rise from the US\$5 100 million actually committed in 1978 to between US\$11 000 million and US\$12 500 million in 1990 and to between US\$15 000 million and US\$18 000 million by 2000, on 1975 prices.

Investment in agriculture in developing countries ¹ 1980 and requirements in 1990 and 2000

US\$
10 millions
(year)



Selected investments	Brief description	Physical magnitudes (net additions 1980-2000)	Average unit cost US\$	Gross investment ('000 million US\$ total 1980-2000)
Increase of land under crops	Unit cost is weighted average of costs estimated separately for each of 4 land classes.	151 million ha	424/ha	64.0
Extension and improvement of irrigation	Covers gravity and pump/tubewell schemes and includes investment for conversion of partially to fully equipped irrigated land; unit cost is weighted average of different regional costs; depreciation rate: 2.3% p.a.	43 million ha	2 382/ha	187.4 ⁴
Tractors and equipment	Standard units composed of 1 45-hp 4-wheel tractor, 3-bottom mouldboard plough, tandem disc harrow, seed-drill, trailer, plus, for Latin America and Near East only, 1 combine harvester per 7 units. Depreciation rate: 12.5% p.a. Unit cost is weighted average.	11.6 million units	13 700/unit	330.3 ⁴
Increase in livestock numbers	Animals in millions added to existing stocks: 330 cattle, 380 sheep/goats, 90 pigs, 3 800 poultry; valued in terms of meat equivalent at 1 200, 1 108, 1 626 and 1 144 US\$/ton, respectively.			125.2
Investment in meat production	Two thirds of increase in meat output assumed to come from projects requiring investment of US\$ 4 000/ton, including depreciation.	25 million tons	4 100/ton	99.0

¹ Data cover 90 developing countries used as the basis for FAO's perspective study Agriculture: Toward 2000. Investment estimates are cumulative, 1980-2000, at 1975 prices.

² The study's estimate of gross annual investment including replacement investment. ³ Gross investments, including replacement investment, in primary crop and livestock farming estimated in Agriculture: Toward 2000 on the assumption that a development goal of a growth toward 4 percent a year for agricultural production of the 90 developing countries covered by the study is accepted. ⁴ Includes replacement investments of 82.1, 31.3 and 171.2 '000 million, respectively. ⁵ "Support" includes storage, transport, marketing, and first-stage processing.

XIV Agricultural development versus the arms race

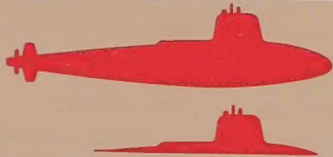



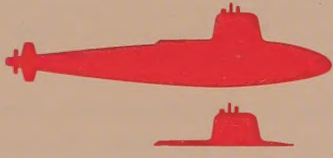
















The natural and financial resources and technical means exist to greatly reduce poverty and hunger in the third world by the end of this century. The policies, programmes and investments that could accomplish this are elaborated in FAO's study of *Agriculture: toward 2000*.

Development investments of the magnitudes indicated on the previous page may seem overwhelming and even unrealistic, but they appear reasonable and feasible when compared to what countries spend on arms — more than US\$1 000 million daily. Although data are imprecise and estimates vary greatly, a United Nations estimate put global military expenditures in 1977 at US\$400 000 million. The Stockholm International Peace Research Institute (SIPRI), estimating that the total would exceed US\$500 000 million in 1980, put the industrialized countries' share at 75 percent, China's at almost 10 percent and that of other developing countries at over 15 percent. An estimate by the US Arms Control and Disarmament Agency (ACDA) covering 1968-77 had all industrialized countries together spending 5.6 percent of their gross national product (GNP) on armaments, 0.33 percent on aid, 3.0 percent on health and 5.9 percent on education.

ACDA estimated that all developing countries expended 5.9 percent of their GNP on armaments, 1.0 percent on health and 2.8 percent on education.

The United Nations has repeatedly stressed the connection between disarmament and development. In the words of a UN expert group, the economic and social consequences of the arms race are so detrimental that its continuation is obviously incompatible with the implementation of the New International Economic Order based on justice, equity and cooperation. A reduction of military budgets could free huge resources for productive purposes. A reallocation of a fair share to the poor countries' development programmes could give dramatic impetus to their agricultural and food production efforts. However, governments thus far have refused to take this path. The UN Disarmament Decade — the 1970s — ended without progress on halting the arms race; the Second UN Development Decade for the same period recorded insufficient progress. But, with mankind's very survival at stake, there is no alternative to pursuing the goals of disarmament and development until they are attained.

Some comparisons with the price of a nuclear submarine

Some aggregates and their cost:			Some aggregates and their cost:		
	in millions of current US\$			in millions of current US\$	
aid to Latin America (1979)	2 477		World Food Programme's food aid commitments for five years up to 1978	1 733	
			World Bank loans for agricultural/rural development (FY 1980)	1 700	
total third world wheat imports (1979)	2 396		Cost of developing 10 million hectares of grazing land in third world	1 500	
			FAO's cumulative budget 1945-81	1 222	
India's total wheat imports (1979)	2 171		Initial resources of International Fund for Agricultural Development	1 061	
			Cost of flood control for 2 million hectares in developing countries	1 000	
Madagascar's gross national product (1978)	2 050		100 million sets of hand tools for third world farmers	1 000	
			Total official technical assistance grants to third world (1978)	817	
Price of one Trident nuclear submarine	2 000*		One million pairs of draught animals for third world	400	
Africa's total wheat imports (1979)	1 796		One million sets of equipment for draught animals in third world	325	
International Development Association concessional loans for agricultural development (FY 1980)	1 758				

Sources: Stockholm International Peace Research Institute, FAO, World Bank, World Food Programme, OECD, International Fund for Agricultural Development.

World economic zones

The economic classes and regions into which the world is divided for the purposes of FAO's analytical studies are given below.

Class I: Developed market economies

Region A — North America: Canada, United States.

Region B — Western Europe: Andorra, Austria, Belgium-Luxembourg, Denmark, Faeroe Islands, Finland, France, Federal Republic of Germany (incl. West Berlin), Gibraltar, Greece, Holy See, Iceland, Ireland, Italy, Liechtenstein, Malta, Monaco, Netherlands, Norway, Portugal (incl. Azores and Madeira), San Marino, Spain, Sweden, Switzerland, United Kingdom (incl. Channel Islands and Isle of Man), Yugoslavia.

Region C — Oceania: Australia, New Zealand.

Region D — Other developed market economies: Israel, Japan (incl. Bonin and Ryukyu Is.), South Africa.

Class II: Developing market economies

Region A — Africa: Algeria, Angola, Benin, Botswana, British Indian Ocean Territory, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Djibouti, Equatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Reunion, Rwanda, Saint Helena, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, Spanish North Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Upper Volta, Western Sahara, Zaire, Zambia, Zimbabwe.

Region B — Latin America: Antigua, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador (incl. Galapagos Islands), El Salvador, Falkland Islands (Malvinas), French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Kitts-Nevis-An-

guilla, Saint Lucia, Saint Vincent, Suriname, Trinidad and Tobago, Turks and Caicos Islands, Uruguay, Venezuela, Virgin Islands (UK), Virgin Islands (US).

Region C — Near East: Africa: Egypt, Libya, Sudan. *Asia:* Afghanistan, Bahrain, Cyprus, Gaza Strip (Palestine), Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Kingdom of Saudi Arabia, Syria, Turkey, United Arab Emirates, Yemen Arab Republic, Democratic Yemen.

Region D — Far East: Bangladesh, Bhutan, Brunei, Burma, East Timor, Hong Kong, India, Indonesia, Republic of Korea, Lao, Macau, Malaysia, Maldives, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand.

Region E — Other developing market economies: America: Bermuda, Greenland, Saint Pierre and Miquelon. *Oceania:* American Samoa, Canton and Enderbury Islands, Christmas Island (Aust.), Cocos (Keeling) Islands, Cook Islands, Fiji, French Polynesia, Guam, Johnston Island, Kiribati, Midway Islands, Nauru, New Caledonia, Niue, Norfolk Island, Pacific Islands (Trust Territory), Papua New Guinea, Pitcairn Island, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wake Island, Wallis and Futuna Islands.

Class III: Centrally planned economies

Region A — Asia: China, Democratic Kampuchea, Democratic People's Republic of Korea, Mongolia, Viet Nam.

Region B — Eastern Europe and USSR: Albania, Bulgaria, Czechoslovakia, German Democratic Republic (incl. East Berlin), Hungary, Poland, Romania, USSR.

All developed countries

Includes developed market economies and Region B of centrally planned economies.

All developing countries

Includes developing market economies and Region A of centrally planned economies.

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